

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE Ordinary Level

MARK SCHEME for the May/June 2008 question paper

5096 HUMAN AND SOCIAL BIOLOGY

5096/02

Paper 2 (Theory), maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the May/June 2008 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

Page 2	Mark Scheme	Syllabus
	GCE O LEVEL – May/June 2008	5096

Section A

- 1 (a) labels to correct parts of root cell;;;
- (b) (i) no nucleus/no named organelles/smaller;
- (ii) has cell wall/cytoplasm/membrane, etc.; [2]
- (c) bone cell/osteoblast/osteocyte;
cone; **R** rod/iris
rbc/erythrocyte;
sperm/egg or ovum/gamete/sex cell; [4]
- (d) **A** = muscle/triceps;
B = bone/humerus;
C = ligament/joint capsule;
D = cartilage;
E = tendon/biceps tendon; **R** muscle/biceps [5]
- (e) (i) **C**; *letters only here*
- (ii) **A**;
- (iii) **E**;
- (iv) **D**; [4]
- (f) (i) respiration/energy release;
- (ii) **A**; [2]
- [Total: 20]
- 2 (a) 3 points plotted;;; line to join them; [4]
- (b) 36–40 weeks/last 4 weeks/anywhere within, e.g. 38; [1]
- (c) 4.0 to 5.0 1 mark for graph extension; 1 mark for numerical answer; [2]
- [Total: 7]
- 3 (a) water entered; by osmosis; water more dilute than cytoplasm/cytoplasm more concentrated than water/correct ref to water potential; cells burst; [Max. 3]
- (b) water lost; by osmosis/exosmosis; cells shrunken; [Max. 2]
- [Total: 5]

Page 3	Mark Scheme	Syllabus
	GCE O LEVEL – May/June 2008	5096

- 4 (a) uptake (by plants); denitrification;
- (b) (i) lower/reduce it;
- (ii) flooding lowers oxygen levels/gives anaerobic conditions; water fills air spaces in soil; less oxygen dissolved in water than present in air; so less nitrification; less decay; more denitrification; dilution; [Max. 3]
- [Total: 6]

- 5 (a) M to cornified layer/A hair;
N to a receptor;
O to malphigian layer/hair follicle;
P to sweat gland;
Q to arteriole; [5]
- (b) (i) to sensory neurone; *not receptor endings*
- (ii) to the motor; *not end plates.* [2]
- [Total: 7]

- 6 (a) fish has less fat/A has more calcium; [1]
- (b) (i) potatoes;
- (ii) eggs; [2]
- (c) rice has more energy; more protein; *ignore refs to carbohydrates/fats* [2]
- [Total: 5]

- 7 (a) plasma cells; memory cells; [2]
- (b) mitosis; [1]
- (c) memory cells; [1]
- (d) to make antibodies; R contains antibodies [1]
- [Total: 5]

[Section A = 55]

Page 4	Mark Scheme	Syllabus
	GCE O LEVEL – May/June 2008	5096

Section B

8 (a) cholera

bacterium/Vibrio;
 via drinking; water;
 contaminated by faeces;
 via food;
 infected by flies/dirty hands;
 lives in gut/intestine;
 profuse, watery diarrhoea/
 'rice waterstools';
 dehydration;
 fever/feels hot/sweats;
 cramps; **R** vomiting

schistosomiasis

flatworm/fluke/worm;
 by drinking; or swimming/paddling;
 in water;
 contaminated by faeces/urine;
 larvae; bores through skin/buccal lining;
 in blood vessels of gut/bladder;
 blood in faeces/urine;
 ulceration of gut/bladder;
 liver damage;
 anaemia;

[Max. 10]

(b) UV light kills some bacteria (in reservoir);

particles sediment;
 bacteria filtered at **S**; *this and next 5 items must be tied to S as a filter*
 through sand;
 covered with mucilage layer;
 full of protozoa/insect larvae;
 which eat bacteria;
 chemicals may be added to flocculate/precipitate the bacteria (for faster filtration);
chlorine added to water;
 stored in closed tanks;
 chlorine destroys/kills all bacteria/viruses **A** germs;

[Max. 5]

9 (a) **F** = hepatic vein;**G** = hepatic artery;**H** = hepatic portal vein/portal vein;

[3]

Page 5	Mark Scheme	Syllabus
	GCE O LEVEL – May/June 2008	5096

- (b) liver makes bile;
 bile alkaline;
 helps to neutralise acidity from stomach/chyme/raise pH;
 makes pH suitable for named enzymes here;
 emulsifies fats; **R** *breaks down fats*
 which speeds lipase action;
 stimulates peristalsis;

[Max. 3]

- (c) insulin;
 when glucose levels high;
 makes liver cells take up glucose (from blood);
 some respired;
 some converted to glycogen;
 stored in liver (cells);
 some to fat;
 so blood glucose falls;
glucagon;
 when glucose levels low;
 stimulates conversion of glycogen to glucose (in cells);
 glucose released to blood;
 adrenaline;
 stimulates conversion of glycogen to glucose;
 quickly/in emergency;
 so blood levels rise;

[Max. 9]

Page 6	Mark Scheme	Syllabus
	GCE O LEVEL – May/June 2008	5096

10 Either

- (a) antiseptics are man-made chemicals; **R** *chemicals solus*
cannot be taken internally/used on body surface;
or on utensils/working surfaces;
kills/stops growth of microbes;
antibiotics made by microbes;
can be taken internally;
anti-microbial (bacteria/fungi);
kill bacteria/fungi or stop growth of them;

[Max. 4]

- (b) to build high concentration of chemical in body;
for long enough;
to kill all microbes/bacteria/germs (so none remain);
low concentration may allow survival of some;
which may multiply;
some may become resistant/change to stronger form;
by mutation/genetic change implied;

[Max. 4]

- (c) resistance has occurred/bacteria have evolved;
due to mutation;
since early ones used widely (on animals)/indiscriminately;
in animal foods;

[Max. 2]

- (d) prepare dish of nutrient agar/or broth;
add bacterial solution;
add paper disc soaked in new substance;
incubate;
at suitable temperature;
for day or two;
examine for signs of bacterial suppression at disc;

[Max. 5]

also credit: 2 plates/flasks of broth; bacteria to both; suspected antibiotic to one;
compare one with another;

10 or

- (a) egestion is removal of faeces/undigested material;
from gut/anus;
material that has passed straight through gut/not entered blood, cells;
excretion is removal of metabolic wastes/chemicals made inside cells;
from the blood;
e.g. urea/carbon dioxide;

[Max. 4]

- (b) faeces and/or urine;
may contain pathogens;
such as bacteria;
or eggs of parasites;
source of infection of others/may spread disease;
either by direct contamination (of food/water); **R** *environment here*
or via vectors/flies, etc;

[Max. 4]

Page 7	Mark Scheme	Syllabus
	GCE O LEVEL – May/June 2008	5096

(c) sugar + oxygen =;
carbon dioxide + water + energy; **A** symbols

(d) blow into lime water;
at rest;
how? – via tube;
take exercise;
blow into lime water again;
same volume;
for same period;
compare two solutions;
degree of milkiness;
suggestion how to measure amount of milkiness;
or to same end point/milkiness;
compare time taken to reach this;

[Max. 5]